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Results of Double-star Measures with the 8-*inch Equatorial at Windsor, New South Wales, in* 1894.

By John Tebbutt.

Ref. No.	Star.	Observed Magnitude	Approx. Place of Star. R. A.	Approx. Place of Star. Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Eyes.	Hour-angles.	Hour-angles.	Weight, 1 to 5.
			h m	° ′		°		″				h m	h m	
1	*β* Phœnicis	5, 5	1 1·4	47 17	·838	21·8	10	1·68	8	300	P	1 33 E	1 1 E	5
2	,,	5, 5	,,	,,	·841	22·5	10	1·80	10	300	P	3 25 E	2 58 E	5
3	,,	...	,,	,,	·846	23·2	10	...	...	300	P	3 19 E	2 59 E	3
4	,,	...	,,	,,	·849	24·9	10	1·45	10	300	P	3 18 E	2 51 E	5
5	*ζ* Phœnicis	4, 8	1 3·9	55 49	·890	243·2	10	...	...	230	P	1 35 E	1 1 E	2
6	,,	4, 8	,,	,,	·890	...	...	6·52	8	138	P			3
7	*κ* Toucani	5, 7	1 12·2	69 26	·846	354·9	10	5·50	10	300	P	2 49 E	2 18 E	4
8	,,	$5\frac{1}{2}$, 8	,,	,,	·849	354·9	10	5·49	10	300	R	2 47 E	2 18 E	4
9	,,	5, 8	,,	,,	·887	354·4	10	5·58	10	300	R	1 5 E	0 33 E	5
10	*h* 3447	...	1 31·2	30 27	·846	90·7	10	...	...	300	P	2 9 E	...	4
11	,,	$5\frac{1}{2}$, 8	,,	,,	·849	92·0	10	2·05	8	300	P	1 58 E	1 27 E	4
12	,,	6, $8\frac{1}{2}$	,,	,,	·884	91·4	10	2·16	7	300	R	1 45 E	1 19 E	4
13	,,	6, $8\frac{1}{2}$	,,	,,	·887	91·3	10	2·07	8	300	R	2 16 E	1 51 E	4
14	*p* Eridani	...	1 35·8	56 44	·772	...	...	7·59	10	170	R	5 4 E	4 47 E	4
15	,,	...	,,	,,	·772	...	...	7·37	10	170	P	1 54 E	1 34 E	5
16	,,	...	,,	,,	·775	...	...	7·26	10	170	R	4 32 E	4 14 E	4
17	,,	...	,,	,,	·775	222·9	7	...	...	300	P	3 53 E	3 21 E	3
18	,,	...	,,	,,	·780	225·3	20	6·99	10	300	P	3 55 E	3 13 E	4
19	,,	...	,,	,,	·789	224·4	10	7·34	10	300	P	...	3 21 E	5

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			h m	° ′		°		″				h m	h m	
20	*p* Eridani	...	1 35·8	56 44	·805	225·0	10	7·39	10	300	P	2 11 E	1 37 E	5
21	„	...	„	„	·808	225·4	10	7·41	10	300	R	3 22 E	2 51 E	5
22	„	...	„	„	·813	226·2	10	...	...	300	R	3 58 E	3 30 E	3
23	„	...	„	„	·816	224·8	10	7·41	10	300	P	2 38 E	2 8 E	4
24	„	...	„	„	·819	224·5	10	...	...	300	P	3 47 E	3 28 E	3
25	„	5½, 5½	„	„	·975	227·0	10	7·33	8	300	R	2 12 W	2 48 W	4
26	*h* 3592	6, 9	3 41·9	54 36	·838	17·0	10	5·28	10	138	P	3 20 E	2 36 E	5
27	„	6, 9	„	„	·887	16·6	10	5·63	10	138	P	2 46 E	2 15 E	5
28	Lac. 2145	7, 7	6 2·0	48 27	·884	33·5	10	1·88	10	300	P	3 59 E	3 27 E	4
29	„	7, 7	„	„	·967	31·8	10	1·60	8	300	P	2 51 E	2 24 E	5
30	„	7, 7	„	„	·972	32·2	10	...	...	300	P	3 7 E	2 47 E	3
31	„	7. 7	„	„	·975	31·2	10	1·52	10	300	P	3 4 E	2 32 E	3
32	α Centauri	...	14 32·4	60 24	·758	...	...	20·87	5	170	...	3 34 W	3 46 W	4
33	„	...	„	„	·758	...	...	21·06	7	170	P	3 46 W	4 0 W	4
34	„	...	„	„	·767	...	...	20·57	7	170	R	1 2 W	1 15 W	2
35	„	...	„	„	·767	...	...	20·89	7	170	P	3 16 W	3 33 W	3
36	„	...	„	„	·767	...	...	20·67	10	170	P	3 27 E	3 2 E	3
37	„	...	„	„	·769	...	...	20·59	8	170	R	0 54 W	1 29 W	4
38	„	...	„	„	·772	...	...	20·60	10	170	P	4 24 W	4 40 W	4
39	„	...	„	„	·775	...	...	20·70	10	170	P	3 43 W	3 57 W	4
40	„	...	„	„	·780	208·1	10	...	...	140	P	2 26 W	2 41 W	3

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			h m	° ′		°		″				h m	h m	
41	*α* Centauri	...	14 32·4	60 24	·780	208·1	10	...	...	300	P	3 30 W	3 42 W	4
42	„	...	„	„	·789	208·7	10	20·69	10	140	R	1 34 W	2 6 W	4
43	„	...	„	„	·789	207·3	10	20·74	10	300	P	3 0 W	3 34 W	3
44	„	...	„	„	·789	208·4	10	...	...	300	R	3 39 W	3 49 W	3
45	„	...	„	„	·789	208·4	10	...	...	300	P	3 49 W	4 0 W	3
46	„	...	„	„	·802	207·3	10	20·59	10	300	P	4 28 W	5 3 W	4
47	„	...	„	„	·805	208·0	10	...	...	300	P	4 6 W	4 20 W	3
48	„	...	„	„	·805	208·2	10	...	...	300	R	4 47 W	4 57 W	4
49	„	...	„	„	·808	208·1	10	...	...	300	P	2 55 W	3 10 W	4
50	„	...	„	„	·808	208·1	10	...	...	300	R	3 12 W	3 22 W	4
51	*γ* Coronæ Aust.	...	18 59·3	37 13	·772	...	...	1·82	10	170	R	0 49 W	1 9 W	3
52	„	...	„	„	·775	...	...	1·57	10	170	P	1 34 W	1 50 W	5
53	„	...	„	„	·789	166·4	9	1·47	10	300	P	1 48 W	2 19 W	4
54	„	...	„	„	·805	165·4	10	1·56	10	300	P	2 10 W	2 41 W	5
55	„	...	„	„	·808	165·0	10	1·56	10	300	P	2 12 W	2 42 W	5
56	„	6½, 6½	„	„	·819	165·5	10	...	...	300	P	3 29 W	3 48 W	5
57	„	...	„	„	·824	165·3	10	1·71	8	300	P	4 40 W	5 25 W	5
58	Lac. 8550	7, 7	20 42·8	62 49	·819	94·9	10	...	...	300	R	2 19 W	2 48 W	4
59	„	...	„	„	·821	94·9	10	2·28	10	300	P	1 16 W	1 58 W	4
60	„	...	„	„	·824	95·7	10	·88	10	300	R	2 5 W	2 43 W	5
61	*h* 5295⅔	6, 8½	21 41·4	47 47	·895	359·8	...	44·31	5	74	P	2 35 W	3 11 W	4
62	„	6, 8½	„	„	·895	359·8	...	44·36	5	112	P			4

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			h m	° ′		°		″				h m	h m	
63	*h* 5295⅔	6, 8½	21 41·4	47 47	·904	359·8	...	44·44	10	74	P	3 0 W	3 28 W	4
64	"	6, 8	"	"	·967	359·8	...	44·50	7	74	P	3 7 W	4 4 W	4
65	"	6, 8½	"	"	·967	0·3	10	44·70	10	138	P	4 20 W	4 52 W	4

Remarks.

In the column headed "Eyes" P denotes that the line joining the observer's eyes was parallel to that joining the components, and R that these lines were at right angles. The column headed "Hour-angles" gives the hour-angles between which the measures were made, and that headed "Weight" gives the value of each result on a scale of 1 to 5, 1 denoting the worst possible, and 5 the best possible conditions.

With the exception of Nos. 14, 15, 16, 32, 33, 34, 35, 36, 37, 38, 39, 51, 52, 61, 62, 63, 64, the measures were made with the Cooke position filar micrometer. These measures were made with the Grubb filar micrometer without a position circle. No. 32 is the result of measured differences of declination with an assumed position angle = 208°.

For Nos. 14, 15, 16, 33, 34, 35, 36, 37, 38, 39, 51, 52, the transit thread was set parallel to the components, but for Nos. 61, 62, 63, 64 the distance threads were set parallel to the star's diurnal path. It was found during these four sets of measures that the components were together accurately bisected by the transit thread, so that the position angle is adopted as 359° 8, a small correction being applied for an error in the perpendicularity of the transit and distance threads. Nos. 32 to 50, both included, were observed in sunlight, and Nos. 2 and 3 in twilight.

The components of Nos. 1, 2, 4, 14, 15, 22, 23, 24, 25, 28, 29, 30, 51, 56, 58 were noted to be equal. Of Nos. 5 and 6 the primary was white and the companion pale blue.

The position angle of Nos. 10, 11, 12, 13 has increased about 15° since 1836. Hargrave, of Sydney, states that he could not divide the components in 1882 with a power of 333. As his position for the star is considerably in error, it is probable that he has mistaken another object for Herschel's star.

Of Nos. 26 and 27 the primary is straw yellow, and the companion bluish.

The south component of No. 31 was very slightly the brighter.

The position angle of Nos. 28, 29, 30, 31 has increased 50°, and the distance diminished 2″ since Herschel's observations in 1835. The position angle of Nos. 61, 62, 63, 64, 65 has diminished 14°, and the distance increased 14″ since 1836. The change is probably due to proper motion of the smaller star.

Windsor, N.S. Wales: 1895 *January* 15.

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A List of Probably New Double Stars. By R. T. A. Innes.

During the last two months whilst I had the loan of a telescope belonging to Mr. W. F. Gale, of Sydney, I came across the double stars in the following list, all of which I believe are new. The telescope had a 6¼-inch object glass, made by T. Cooke, York, 1851, and was mounted on a rough equatorial without circles. The eyepiece used gave a power of about 360. I puzzled out the stars found, with the help of Proctor's smaller Atlas and Stone's Cape Catalogue, with fair success, but I generally add a note in reference to neighbouring stars, which will render the identification easier. The positions are for 1900. Angles, &c., are estimations. This list, the result of about thirty hours' searching, will prove what a mine of wealth awaits the diligent double-star observer in the southern hemisphere.

On account of the difficulty of identifying stars I confined my search to the neighbourhood of naked-eye stars, and only registered those which required some attention to notice their duplicity. None of these stars are in Herschel's or the Sydney Observatory lists.

G 1	Stone 1830	$4^{h}\ 14^{m}{\cdot}8$	$-61^{\circ}\ 12'$	
1894·8	300° ±	$0''{\cdot}8$ ±	5½ and 7	2n

G 2	ξ Pavonis	$18^{h}\ 14^{m}{\cdot}0$	$-61^{\circ}\ 32'$	
1894·8	170° ±	$4''{\cdot}0$ ±	5 and 10·7	2n.

Detected by Mr. Gale with his 8½-inch, previously to my seeing them.

No. 1	λ^1 Toucanæ	$0^{h}\ 49^{m}{\cdot}4$	$-63^{\circ}\ 25'$	
1894·9	90° ±	3″ ±	6 and 8·5	1n.

This star is marked double in Proctor's smaller Atlas, whilst λ^2 *Toucanæ*, a double discovered by Dunlop, is not so marked. Professor Auwers in his proposed list of southern standard stars also overlooked the duplicity of λ^2.

No. 2	St. 1746	$4^{h}\ 1^{m}{\cdot}1$	$-59^{\circ}\ 51'$	
1894·9	90° ±	2″ ±	7·5 and 9	1n.

The S star of a small finder pair making a right angle with ϵ and ι Reticuli :

No. 3	St. 2879	$6^{h}\ 11^{m}{\cdot}5$	$-61^{\circ}\ 27'$	
1894·8	350° ±	$0''{\cdot}8$ ±	6·5 and 7	2n.